

Claims

1. A method of treating a surface for the removal of a surface portion thereof, comprising the steps of
5 producing a beam of laser light and obscuring a low power density part of the laser beam before irradiating a surface location with the laser light.
2. A method of treating a surface according to claim 1
10 wherein the low power density part of the laser beam that is obscured is a part below a threshold power density for surface removal.
3. A method of treating a surface according to either claim
15 1 or claim 2 wherein the laser light is obscured by a shadow mask such that laser light incident upon the mask is substantially adsorbed by the mask.
4. A method of treating a surface according to claim 3
20 wherein the shadow mask adsorbs all of a low power density portion of a laser beam.
5. A method of treating a surface according to either claim
25 1 or 2 wherein the laser light is obscured by a reflective mask such that light incident upon the mask is reflected by the mask.
6. A method of treating a surface according to claim 5
30 wherein the portion of laser light incident upon the mask is substantially reflected by the mask.

7. A method of treating a surface according to claim 6 wherein the portion of laser light reflected by the mask comprises most of a low power density portion of the laser beam.
- 5
8. A method of treating a surface according to any one of claims 5, 6 or 7 wherein the reflection redirects low power density laser light to another low power density portion of the laser beam so as to create an additional
- 10 high power density portion of the laser beam.
9. A method of treating a surface according to any one of claims 5, 6 or 7 wherein the portion of laser light reflected by the mask comprises all of a low power
- 15 density portion of the laser beam.
10. A method of treating a surface according to any one of claims 5 to 10 wherein the reflection redirects low power density laser light to a high power density portion of
- 20 the laser beam.
11. A method of treating a surface according to any one previous claim wherein the mask is provided with an aperture.
- 25
12. A method of treating a surface according to claim 11 wherein a high power density part of a laser beam passes through the aperture.

13. A method of treating a surface according to either claim 11 or claim 12 wherein the mask is tubular.
14. A method of treating a surface according to claim 13
5 wherein the mask is cylindrical.
15. A method of treating a surface according to any one previous claim wherein the mask comprises a metal or a ceramic.
- 10 16. A method according to any one previous claim wherein the laser is an Yttrium Aluminium Garnet (YAG) laser.
17. A method according to any one previous claim wherein
15 the surface is a concrete surface.
18. A method according to claim 12 wherein the surface is a concrete surface contaminated with radionuclides.
- 20 19. A method according to any one previous claim wherein the surface portion is removed by the effects of thermal shock.
- 25 20. An apparatus for treating a surface for the removal of a surface portion thereof, the apparatus comprising a laser source for producing a laser beam for irradiating a surface location with laser light so as to remove the surface portion wherein a low power density part of the laser beam is obscured by mask means.

30

21. An apparatus for treating a surface according to claim 20 wherein the mask means comprises a shadow mask to adsorb 'low intensity' radiation.
- 5 22. An apparatus for treating a surface according to claim 21 wherein the mask means comprises a reflective mask to redirect at least a part of the 'low intensity' portion of the radiation.
- 10 23. An apparatus for treating a surface according to either one of claims 21 or 22 wherein the 'low intensity' portion of the radiation is that portion below a threshold power level for causing scabbling.
- 15 24. An apparatus according to any one of claims 21, 22 or 23 for treating a surface wherein the mask means is coated.
25. An apparatus for treating a surface according to claim 20 24 wherein the coating is a light adsorbing coating.
26. An apparatus for treating a surface according to claim 24 wherein the coating is a reflective coating.
- 25 27. A method of treating a surface for the removal of a surface portion substantially as hereinbefore described with reference to the accompanying description and any one of drawings 4, 5, 6, 7 and 8.

28. An apparatus for treating a surface for the removal of a surface portion substantially as hereinbefore described with reference to the accompanying description and any one of drawings 4, 5, 6, 7 and 8.

5